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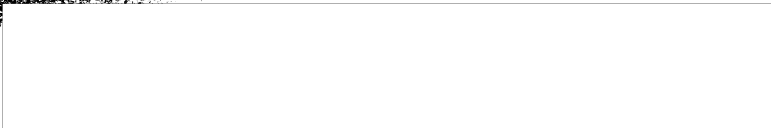
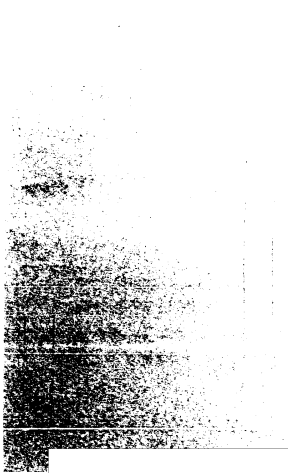


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GARBAGE DISPOSAL UNIT
Description and Maintenance
Instructions



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I. DESCRIPTION

A. APPLICATION AND BASIC CHARACTERISTICS

The garbage disposal unit is designed for discharging overboard garbage and other food remnants (except for bones) when running on the surface and submerged within the operating depth of submergence at a speed up to 8 knots.

The maximum weight of parts of the unit during disassembly does not exceed 98 kg. The maximum permissible pressure inside the hopper during blowing is 35 kgf/sq.cm.

B. GENERAL DESCRIPTION AND DESCRIPTION OF INDIVIDUAL UNITS

(See Appendix No.1)

The garbage disposal unit is arranged in compartment IV between frames 78-79, starboard.

The unit consists of hopper 1, of approximately 30-lit.capacity; shut-off valve 2; non-return screw-down flapper valve 5; drive 3 for the flapper valve; water and air pipe lines with all necessary shut-off and check fittings.

After the hopper has been charged with garbage, sea water is added there, after which the hopper is blown with compressed air. After blowing, the air is bled from the hopper into the compartment either through the check valve or through the deodorizing filter.

1. Hopper

(See Appendix No.2)

This consists of casing 13, ring 11 of the closing gear, cover 9, bracket 7 for hingeing the cover and drive 16 of the closing gear.

The casing is welded of a steel plate, with flange 15 being available in the lower taper portion. The flange is used to connect the shut-off valve. Support ring 14 is provided for attachment of the hopper to the foundation. Welded to the top of the casing is coaming 12 with grooves and an annular recess to drive ring 11 of the closing gear equipped with quadrant 19. The range of turning of ring 11 is limited with stop 18 and stopper 22.

On the casing there are weld-ons to secure bracket 7 for hingeing the cover and the bracket of the drive for opening and closing the cover. Welded on to the casing are pipe unions to supply water and air to the hopper. Inside the casing a removable grating is installed.

Steel welded cover 9 is equipped with closing gear removable with it and levers 8 for hingeing the cover on the casing of the hopper. At the top of the cover a check plug and a handle for hingeing the cover are provided. Rubber packing ring 10 being arranged in the bottom of the cover.

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The pipe lines from the hopper as far as valves 37, 38 and 41 are tested together with the hopper under a pressure of 35 kgf/sq.cm by flooding the hopper with water and by blowing it with air fed from the intermediate pressure air system.

During the test the cover of the hopper shall reliably be closed.

The pipe line running from valve 38 for the deodorizing filter is tested under a pressure of 0.5 kgf/sq.cm.

The drain pipe line is subjected to flood test.

D. CONTROL INSTRUMENTS

The pipe line feeding air to the hopper is provided with pressure gauge 36 to check the presence of air pressure in the hopper with valve 37 closed, as well as the value of air pressure for blowing the loaded hopper.

In case air is present in the hopper, never open cover 8 until the air has been completely bled from the hopper.

The air bleeding line has pressure gauge 39 to check the pressure of the air bled from the hopper through the deodorizing filter. The pressure shall not rise above 0.5 kgf/sq.cm lest the deodorizing filter should get damaged. The pressure is maintained within the permissible limits with the aid of butterfly valve 38.

The pressure gauges are subjected to tests every year.

Pressure gauge 36, type MTK 100x160/55, rated for a pressure of 60 kgf/sq.cm has a red line against reading 35 kgf/sq.cm which corresponds to the maximum pressure in the intermediate pressure air mains.

Pressure gauge 39, type MTK 100x110/0.5, rated for a pressure of 1 kgf/sq.cm has a red line against reading 0.5 kgf/sq.cm which corresponds to the maximum permissible pressure of air flowing through the deodorizing filter.

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II. MAINTENANCE INSTRUCTIONS

A. GENERAL SUPERVISION AND UPKEEP

- (a) Keep the garbage disposal unit and its water and air supply systems in good order and in constant readiness for action.
- (b) See to it that the pipe lines and the fittings be perfectly tight and give special attention to the sea fittings and flange connections.
- (c) See to it that the gland packings of the valves and flapper valve be in good order.
- (d) See to it that all the friction parts of the fittings and drives are properly lubricated.
- (e) Regularly carry out preventive maintenance and repairs in accordance with the directions outlined in Section II-F.
- (f) Keep the control instruments in first class condition. In case the instruments produce incorrect readings or the terms of their check-ups are over, send them for testing or replace with new ones.

B. PREPARATORY STEPS

Initial Position

- (a) Cover 9 of the hopper is closed and locked with stopper 22.
- (b) The handle of the closing gear drive of the hopper cover is removed and kept in the standard place.
- (c) All the valves of the systems and the non-return screw-down flapper valve are in the CLOSED position.
 - 1. Make sure that no water and air pressure are present in the hopper (regardless of the readings of pressure gauge 36), for which purpose open cock 42 and valve 35.
 - 2. If no water is present in the hopper or after water stops escaping from it and air has been completely bled, close valve 35 and cock 42.

CAUTION!

In case water does not stop escaping from the hopper or air does not stop bleeding, never open the hopper cover until faults have been repaired.

C. STARTING, DURING-SERVICE MAINTENANCE AND STOPPING

- 3. Release ring 11 from stopper 22, mount the handle on drive 16, release the cover by rotating the handle in the counter-clockwise direction and open the cover.
- 4. Load garbage into the hopper. Wipe the coaming of the hopper and the rubber packing ring of the cover with rags to remove waste.

CAUTION!

Do not load tins, large bones and broken glass into the hopper.

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5. Close the cover, by turning the handle in the clockwise direction press it against the coaming and lock ring 11 with stopper 22.
6. If garbage is thick, add sea water, for which purpose open valve 41 on the water line and close it afterwards.
7. Set non-return screw-down flapper valve 5 to the NEUTRAL position (automatic operation) and open shut-off valve 2.

CAUTION!

Never set the flapper valve to the OPEN (forced opening) position when the hopper is being blown.

8. Open valve 37 and blow the hopper. Hissing noise of the air escaping overboard indicates that the blowing has been completed.
9. Close valve 37 and shut-off valve 2.
10. Bleed air from the hopper into the compartment through check valve 35 or through butterfly valve 38 on deodorizing filter 40. When doing so, slowly open butterfly valve 38 and bleed the air from the hopper to the deodorizing filter and simultaneously watch pressure gauge 39 whose readings should not exceed 0.5 kgf/sq.cm, since deodorizing filter 40 is rated for a pressure of 0.5 kgf/sq.cm.

Note: When bleeding air to deodorizing filter 40, regularly (every 25-30 seconds) open valve 35. In case water starts escaping through the check plug, immediately close butterfly valve 38 lest water should get into the deodorizing filter. Presence of water indicates that valve 2 and flapper valve 5 are untight.

11. In case the garbage disposal unit is to be used for the second time, perform the procedures proceeding in accordance with the directions outlined under Items 3 to 10.

12. After garbage has been discharged from the hopper, thoroughly wash the hopper, for which purpose fill the hopper with water twice with the water line, proceeding in accordance with the directions outlined under Item 10 of this Section.

13. After the garbage disposal unit is not to be used for the purpose outlined under Item 12, set the unit to the initial position proceeding in accordance with the directions outlined under Section II-B.

2. PREVENTIVE MAINTENANCE WHEN NOT IN USE**2.1. DAILY MAINTENANCE****2.1.1. General Inspection**

1. Check the unit in good order:
a) in accordance with the directions outlined under Section II-A.

2. Check the performance of preventive maintenance:
a) in accordance with the directions outlined under Section II-F.

3. Check the garbage disposal unit on board the ship:
a) in accordance with the directions outlined under Section II-H.
b) in accordance with the directions outlined under Section II-H.

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Restore the preservative layer, if necessary.

17. Open the cover of the hopper to inspect its interior and replace the rubber packing ring in accordance with the directions of Section II-B and Items 3 and 5 of Section II-C.

18. The wrench for opening valve 2 and the handle for the drive of flapper valve 5 should be removed and kept near the garbage disposal unit.

19. Every year open the inactive unit and its parts to check their condition and to reactivate the unit.

E. TROUBLES AND REMEDIES

20. Troubles and their remedies are given below.

| No. | Trouble | Cause | Correction on board the ship |
|-----|--|---|--|
| 21 | Water in hopper | 1. Valve 41 leaky | 1. Blow hopper, close valves 2 and 37 and blow valve 41. Open check valve 35. Open valve 41 by 2-3 turns until water starts escaping through valve 35. Close valve 41. When no water escapes through check valve any longer, valve 41 is considered tight. If after several washings there is leakage, disconnect water supply to valve 41 and remove trouble. |
| 22 | | 2. Valve 2 or flapper valve 5 leaky | 2. Blow hopper. If after several blowings water leakage persists: (a) close flapper valve 5 and lap valve 2 in case the latter is leaky. (b) replace packing ring proceeding in accordance with directions outlined under Item 44, Section II-G, in case flapper valve 5 is leaky. |
| 23 | Air in hopper | Air-feed valve 37 leaky | Cut out air supply from intermediate pressure air system and repair valve 37. |
| 24 | Foreign matter under packing ring of cover | 1. Foreign matter under packing ring of cover | 1. Close valves 41, 37 and 2 and make sure that pressure gauge 36 reads no pressure of air and no water leaks. |

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| No. | Trouble | Cause | Correction on board the ship |
|-----|---------|-------------------------|---|
| | | 2. Packing ring damaged | through valve 35. Open cover of hopper and thoroughly clean packing surfaces of ring 10 and coaming 12 2. Inspect ring 10 and replace it, if necessary |

F. PREVENTIVE MAINTENANCE AND REPAIRS

(a) Daily

25. Follow the directions outlined under Items "a", "b", "c" and "f" of Section II-A.
26. Check the garbage disposal unit for operation, for which purpose fill the unit with water with subsequent blowing it with air proceeding in accordance with the directions outlined under Sections II-B and II-C.

(b) Weekly and Every Time Before Putting to Sea

27. Perform the procedures of daily inspection.
28. Clean the interior of the hopper and its cover with rags soaked in kerosene to remove fat.
29. Coat the friction parts of the garbage disposal unit with lubricant AMC-1.
30. Check the fittings for condition and make sure that the seals on the control instruments are in place and intact.
31. Check the water and air valves.

(c) Every Time When Docking the Submarine

32. Check the condition of the fittings, elbow 4 and pipe 6 in the double-hull section of the hopper.
33. Coat the interior of hopper 1, elbow 4 and pipe 6 with paint or varnish to protect them from corrosion.
34. Check the condition of the outboard fittings following the directions outlined in Section II-B.
35. Check the condition of the rubber rings and gland packing on the outboard fittings. If necessary, the rubber rings and gland packing should be replaced.
36. Clean the oil cups and lubricating channels from the oil cups and lubricating channels.

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37. Remove dirt and old lubricant from the mated joints, the worm drive for the flapper valve and the drive of the closing gear and treat them with fresh lubricant.

38. Check the outboard valves and the garbage disposal unit for tightness.

39. On completion of the docking procedure, before flooding the ball, flapper valve 5 should be closed and left in this position until the garbage disposal unit is to be tested again or to be used for the purpose it is designed for.

G. DISASSEMBLY AND ASSEMBLY

(in the scope of preventive maintenance and inactivation on board the ship)

(a) General

40. The garbage disposal unit may be disassembled only when the submarine is docked.

Hopper 1 and valve 2 may be disassembled when the submarine is afloat, with flapper valve 5 closed.

41. In case of disassembly of the garbage disposal unit, with flapper valve 5 closed, the handle for opening and closing the flapper valve must be removed from the drive. In this case special care shall be given to the drive for opening and closing the flapper valve.

42. Before complete disassembly of the garbage disposal unit, its individual parts, mark all the mating parts and especially seals.

43. To replace the packing ring on the hopper cover or to disassemble the closing gear for inactivation, close valve 2 and flapper valve 5 and remove the wrench for opening the valve and the handle for opening the flapper valve.

44. The packing ring of flapper valve 5 may be replaced with an alternative packing ring in the outlet branch pipe (provided the alternative packing ring ensures perfect tightness and reliable attachment of the flapper valve during docking of the submarine).

(b) Disassembly

45. The individual parts of the garbage disposal unit for maintenance follow the requirements outlined under 40.

46. In case of disassembly of some parts of the unit, strictly observe the requirements outlined under 41.

(c) Assembly

47. Assembly is in the order reverse to disassembly.

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Prior to assembly wash all the parts in kerosene and wipe them dry with clean rags.

48. After assembly check the garbage disposal unit for tightness in accordance with the requirements of the respective drawings.

49. Check the garbage disposal unit for operation proceeding in accordance with the requirements outlined under Sections II-B and II-C.

H. INACTIVATION AND ACTIVATION

(a) Inactivation on Board the Ship

50. Start inactivation of the unit when it is in the initial position in accordance with Section II-B.

51. Open the cover of the hopper proceeding in accordance with the directions outlined under Items 1 and 2, Section II-B, and Item 3, Section II-C.

52. Clean the interior of the hopper and its cover from fat, clean them with rags soaked in kerosene, wipe dry with clean rags and then coat with a layer of lubricant AMC-1.

53. Clean the unpainted surfaces of the hopper parts and of the flapper valve drive, as well as the friction and machined surfaces of the parts from dirt and old lubricant and then coat them with fresh anti-rust coating compound.

54. Close the cover of the hopper, tighten it up with the closing gear and lock the closing gear with stopper 22. Remove the nut from the rotating gear drive and close check valve 35.

55. Remove the wrench from valve 2 and the handle from the handle of flapper valve 5. Keep them near the garbage disposal unit.

(b) Activation on Board the Ship

56. Completely remove corrosion-preventive coating from the parts of the unit, wash them with kerosene, wipe dry with rags, inspect the parts to make sure that they are in good order and coat them with a thin layer of lubricant AMC-1.

57. Check the garbage disposal unit for operation proceeding in accordance with the requirements outlined under Section II-C by filling the garbage disposal unit with water and blowing it with air.

I. REFERENCE DATA

1. For lubrication of the outboard parts of the garbage disposal unit use lubricant AMC-1.

2. The rubber parts should be used or stored for not more than 5 years.

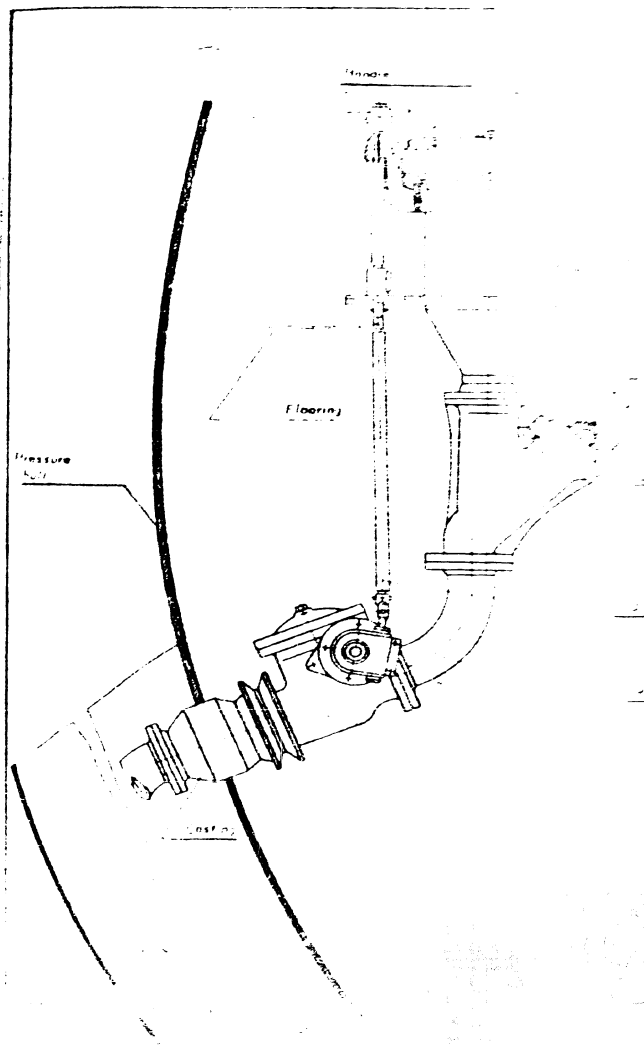
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APPENDICES

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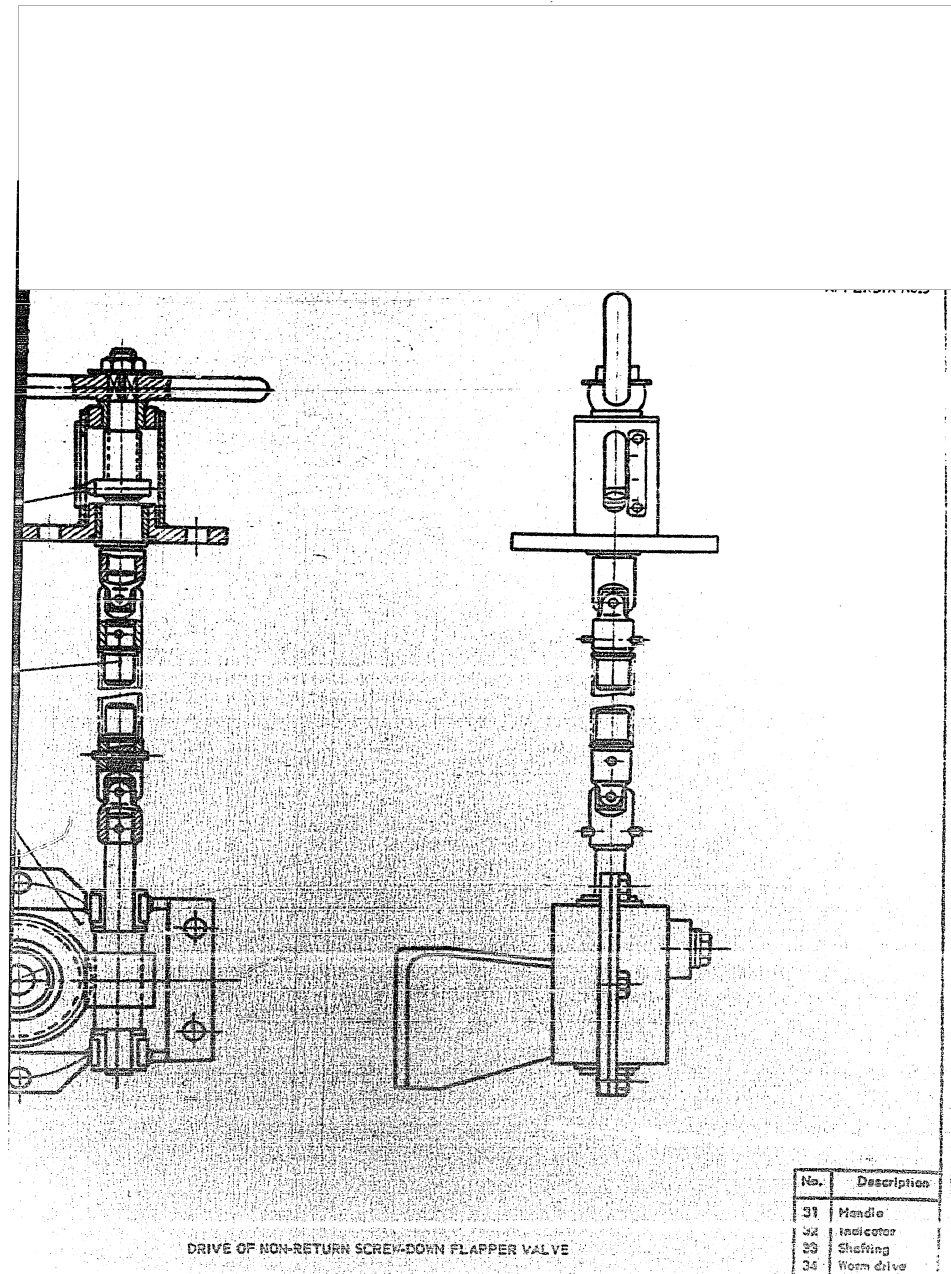
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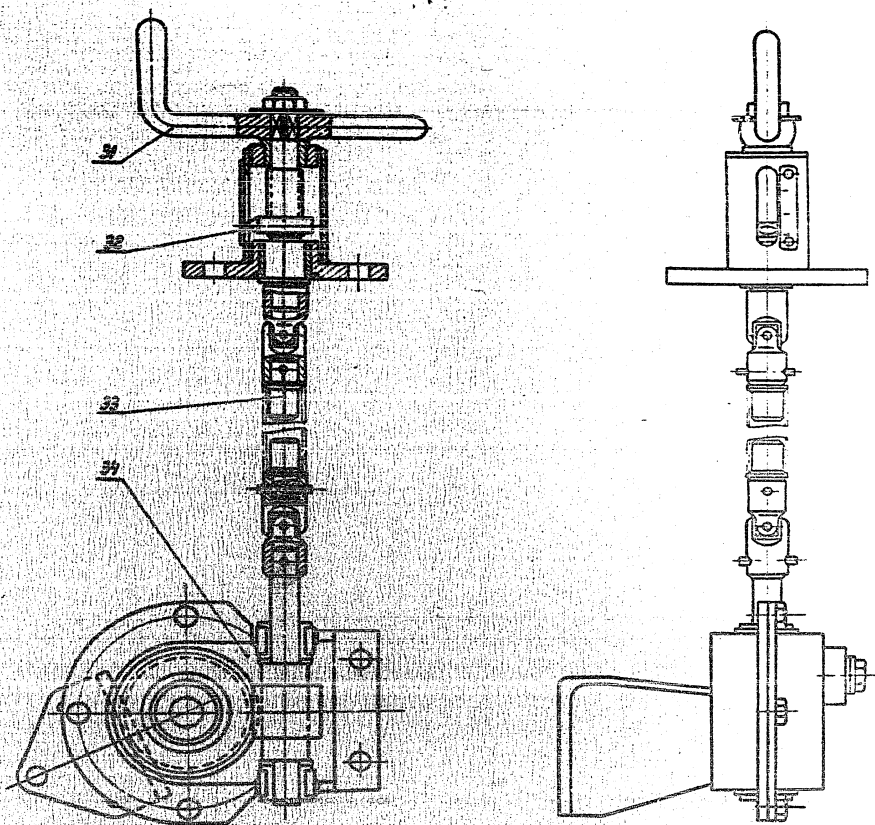
Technical drawing of a mechanical assembly, likely a pump or motor, showing a cross-section of the main body and a detailed view of a component on the right. The main body is labeled with '1' and '2'. The detailed view on the right is labeled with '3' and '4'.

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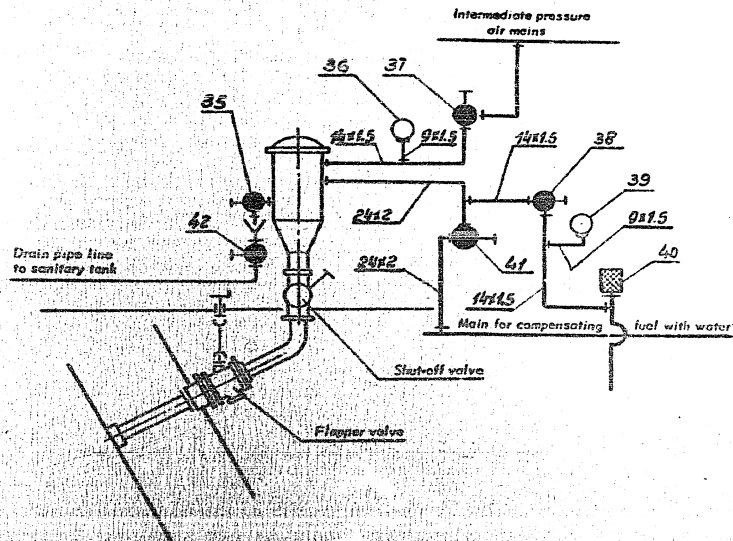
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DRIVE OF NON-RETURN SCREW-DOWN FLAPPER VALVE

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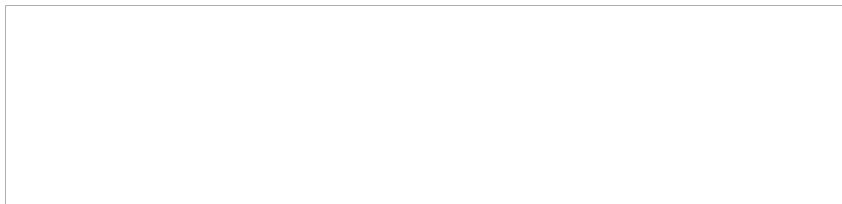


GARBAGE DISPOSAL UNIT SYSTEMS

| No. | Description |
|-----|--------------------|
| 35 | Check valve |
| 36 | Pressure gauge |
| 37 | Angle valve |
| 38 | Butterfly valve |
| 39 | Pressure gauge |
| 40 | Deodorizing filter |
| 41 | Valve |
| 42 | Cock |

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Installation of Garbage
Disposal Unit

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